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FLORAE MALESIANAE PRAECURSORES LVII. THE OLEACEAE OF MALESIA. I. THE GENUS LIGUSTRUM

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SUMMARY

Ligustrum comprises six species in Malesia. Only one species, *L. glomeratum* Bl., is widespread from Malaya to New Guinea; in addition Malaya has an Indo-Chinese species, *L. confusum* Decaisne, and the cultivated *L. sinense* Lour., the Philippines has two endemics, *L. cumingianum* Decaisne and the rare *L. stenophyllum* Quis. & Merr., and New Guinea has the endemic *L. novoguineense* Lingelsheim. *L. undulatum* Bl. is reduced to *L. glomeratum* Bl. and *L. glabrinerve* Elmer to *L. cumingianum* Decaisne.

INTRODUCTION

The genus *Ligustrum* has been monographed twice: by Decaisne (1879) and by Mansfeld (1924). *Ligustrum* has the reputation of being a difficult genus in that the species are difficult to distinguish, this in part is due to the uniform structure of the flower and the variability of characters such as indumentum and leaf shape and size. Fruit shape has been used as a key character, especially the distinction between globose and oblong fruits, but this is a difficult character to interpret in immature or dried fruits. For the Malesian species I have found characters of the inflorescence more constant, in particular the length of the inflorescence (measured from the apex to the lowest branch), the length of the lowest inflorescence branch, and the arrangement of the flowers on the inflorescence.

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LIGUSTRUM LINN.

Ligustrum Linn., Sp. Pl. (1753) 7; Gen. Pl. ed 5. (1754) 18; DC. Prodr., 8 (1844) 295; Blume, Mus. Bot. 1 (1850) 311; Benth. & Hook., Gen. Pl. 2,2 (1876) 679; Decaisne, Nouv. Arch. Mus. Paris II, 2 (1879) 1; Clarke in Hook. *f.*, Fl. Brit. India 3 (1882) 614; Knoblauch in E. & P., Nat. Pflanzenf. IV, 2 (1895) 13; Lingelsheim, Pflanzenr. 72, 243 (1920) 1; Mansfeld, Bot. Jahrb. 59: Beibl. 132 (1924) 19; Johnson, Contrib. N.S. Wales Herb. 2 (1957) 406; Backer & Bakh. *f.*, Fl. Java 2 (1965) 215.
Visiania DC., Prodr. 8 (1844) 289; Miquel, Fl. Ind. Bat. 2 (1857) 548.

Shrub or small tree. Young twigs hairy or glabrous, lenticellate. Exstipulate. *Leaves* opposite, entire, elliptic to more or less oval, rarely linear, apex rounded to acute, less than

15 by 6 cm, usually evergreen and more or less coriaceous, pubescence of leaves very variable, petiole short. *Inflorescences* paniculate, terminal (sometimes with additional inflorescences in axils of upper shoots), usually hairy. Bracts foliaceous, paired and caducous. *Flowers* hermaphodite, regular and 4-merous, in axils of two caducous bracteoles 2—4 mm long, pedicel short or flowers subsessile. *Calyx* short, joined with 4 small teeth, persistent. *Corolla* tubular, 4 oval to lanceolate lobes, induplo-valvate in bud, opening more or less horizontally, lobes as long as or longer than tube, glabrous, white or yellow. *Stamens* 2, filaments thin and short, epipetalous, projecting beyond the corolla tube, anthers elliptic-elongate, extrorse. *Ovary* superior, 2-loculate, globose, placentation axile or pendant, ovules 2 per locule, style short or long, stigma shortly bifid. *Fruit* baccate or drupaceous, ellipsoid to subglobose or elongate, 4—15 mm across, pericarp fleshy, ripening purple or black, endocarp membraneous to leathery. *Seeds* 1 (—3), testa thin, endosperm bony, embryo pendulous, radicle shortly superior.

Distribution: A genus of about 40 species, the majority in temperate Asia, extending to Europe and through Malesia to Australia.

Ecology: Usually of more open places, lowland to montane forest.

Uses: In Europe the Japanese *L. ovalifolium* Hassk. is a common hedge plant; *L. sinense* is cultivated for a similar purpose in Asia.

KEY TO MALESIAN SPECIES OF LIGUSTRUM

1a. Leaves narrowly lanceolate, four times longer than broad. *Philippines*. **6. L. stenophyllum**
b. Leaves lanceolate to ovate, up to about twice as long as broad 2
2a. Inflorescence large, 8—17 cm long from lowest branch to apex and lowest branch 6—10 cm long 3
b. Inflorescence small, 3—9(—11) cm long and lowest branch 1—5 cm long 4
3a. Flowers closely packed together (glomerate), sessile or with a short pedicel to 1 mm long; leaves small, 3—9 cm long. . . . . **3. L. glomeratum**
b. Flowers well-spaced, pedicel 1—3 mm long; leaves large, 7—15 cm long. *New Guinea* **4. L. novoguineense**
4a. Leaves softly downy; flowers with pedicels 1—3 mm long, densely pubescent; plant cultivated as a hedge plant in Malaya. . . . . **5. L. sinense**
b. Leaves glabrous or scarcely pubescent below; flowers with pedicels 0—2 mm long, glabrous or variably hairy 5
5a. Branches of inflorescence horizontal or recurved, flowers arranged in well spaced groups. *Indo-China and Malaya*. . . . . **1. L. confusum**
b. Branches of inflorescence ascending and crowded with flowers. *Philippines*. **2. L. cumingianum**

1. Ligustrum confusum Decaisne

L. confusum Decaisne, Nouv. Arch. Mus. Paris II, 2 (1879) 24; Mansfeld, Bot. Jahrb. 59: Beibl. 132 (1924) 47; Kerr in Craib, Enum. Fl. Siam. 2 (1939) 416.
Olea puberula Ridley, J. Str. Br. Roy. As. Soc. 59 (1911) 128; Fl. Mal. Pen. 2 (1923) 318—319. — *L. robustum auct. non* (Roxb) Bl.: Merrill, J. Arn. Arbor. 35 (1954) 150. — Type: *Ridley 15223* (BM, K, SING).

Straggling shrub to small tree 1.5—4(—8) m tall. *Twigs* pale brown with conspicuous lenticels, youngest twigs hirsute. *Leaves* elliptic ovate, base rounded, apex acute to acuminate, (4.5—)7(—11) cm by (1.5—)4(—5) cm, subcoriaceous, glabrous beneath,

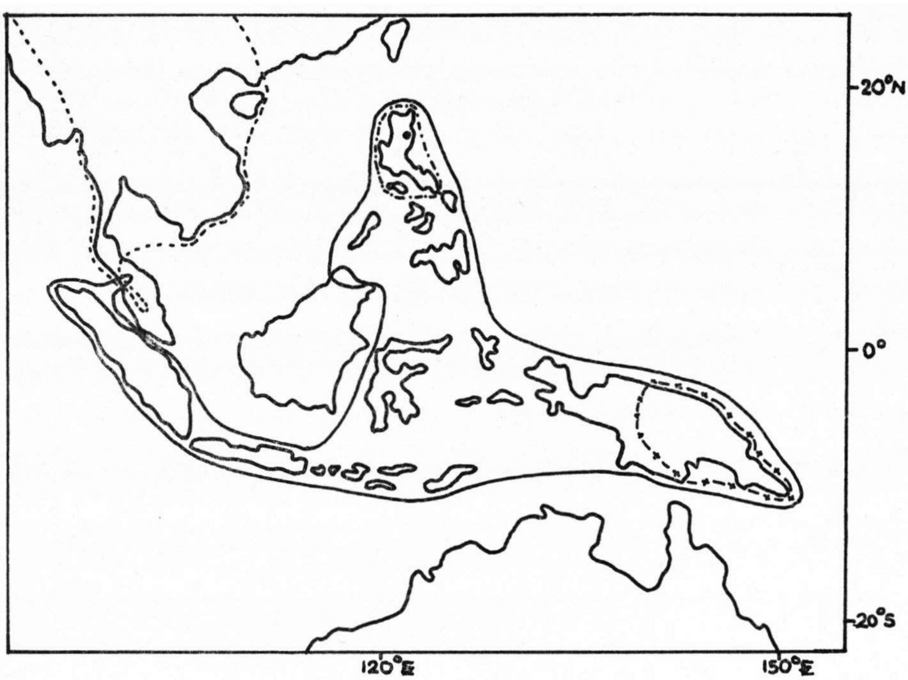


Fig. 1. Distribution of Malesian species of *Ligustrum*. (— — — — *L. confusum*; —.—.—. *L. cumingianum*; ——— *L. glomeratum*; —×—×—×— *L. novoguineensis*; ● *L. stenophyllum*).

glossy above, midrib grooved above, prominent below, veins inconspicuous above, 5—6 pairs. Petiole 0.25—1 cm long, grooved above. *Inflorescences* bristly hairy, 3—9 cm long with 4—6 tiers of branches, lowest branch horizontal or recurved, 1—2.5(—4) cm long, flowering from apex. Bracts to 2.5 cm long. *Flowers* subsessile, clustered in widely spaced groups, 3—4 mm long, sweetly scented. *Calyx* scarcely lobed, tube 1—2 mm long. *Corolla* white or yellow, tube 2 mm long. *Stamens* with slender filaments 1.5—2 mm long, projecting beyond the corolla lobes in open flower, anthers large, 1.5 mm long. *Style* 1 mm long, projecting beyond the calyx after the corolla has fallen. *Fruit* oliveshaped and small, 7×5 mm, fleshy, green ripening purple-black; pedicel 2—4 mm.

Distribution: S. India, Bhutan, Assam, Burma, Thailand, Malaya, Tonkin and Yunnan.

Habitat: Swamp forest, primary forest, scrub; limestone.

MALAYA. Perlis. mainland, *Henderson 22865* (SING), *22941* (K, L, SING), *Ridley 15223* (BM, K, SING); Langkawi Is. *Kochummen 98764* (KEP), *Symington 46749* (KEP). — Pahang. *Chin 440* (KLU) — Selangor. *Chin 400* (KLU), *414* (KLU), *574* (KLU), *Ding Hou 704* (K, KEP, L), *Kiew 188* (UPM), *Stone 8942* (KLU).

Remarks. Ridley did not recognise *Ligustrum* in his flora having described specimens of *Ligustrum confusum* as a new species of *Olea*, (*O. puberula*), with a terminal inflorescence. Merrill considered that Ridley's *O. puberula* 'was apparently a form of *L. robustum* (Roxb.) Bl. with inflorescences narrower than the typical form'. *L. robustum*

is a plant with a northern distribution reaching as far south as the Payap swamp in N. Thailand. It can readily be distinguished from *L. confusum*, a common plant in southern Thailand, by its larger (11—26 cm long) and pyramidal inflorescences with long lower branches (14—25 cm) and its markedly elongated fruits.

L. confusum in Thailand has a wide ecological amplitude and attains its maximum height in *Melaleuca* forest, it frequently has been collected from swamp forest and also once from a tidal stream. In north Malaya it grows in secondary forest but for its most southern distribution it is confined to limestone outcrops. On Bukit Takun it grows in crevices and has been used by countless climbers to pull themselves up the sheer limestone rockface.

Clarke (1882) records *L. robustum* as occurring in Malaya, but I have not been able to find any specimens to confirm this. He (as do most authors) also recorded the fruit shape as globose, but more strictly it is olive-shaped.

2. Ligustrum cumingianum Decaisne

L. cumingianum Decaisne, Nouv. Arch. Mus. Paris II, 2 (1879) 28; Rolfe, J. Bot. 23 (1885) 214; Vidal, Phan. Cuming. Philip. (1885) 125; Rev. Pl. Vasc. Filip. (1886) 181; Merrill, Philip. J. Sci. 1: Suppl. 1 (1906) 116. — *L. glomeratum* var *cumingianum* (Decaisne) Mansfeld, Bot. Jahrb. 59: Beibl. 132 (1924) 59. — Type: *Cuming 1213* (iso in BM, K, L).

L. glabrinerve Elmer, Leafl. Philip. Bot. 9 (1934) 3208. — Type: *Elmer 22247* (A, BM, K, L).

Shrub or small tree to 8 m tall. Young *twigs* densely to minutely pubescent, bark pale brown with lenticels. *Leaves* ovate to narrowly oblong, base rounded, apex acute, (3—) 5.5(—8) cm by 2—4 cm, membraneous to subcoriaceous, glabrous, glossy above, veins conspicuous below, 4—7 pairs. Petiole 0.25—0.75 cm long, glabrous or shortly pubescent. *Inflorescences* 3—7.5 cm long with 4—5 tiers of branches, lowest branch short, 1.5—3(—5) cm long and ascending, main axis glabrous to densely pubescent. Bracts to 2.5 cm long. *Flowers* densely crowded, pedicels 0—2 mm long, flowers large, 3—4 mm long, white or yellow, with a slight fragrance. *Calyx* scarcely lobed, tube 1—1.5 mm long. *Corolla* 3—4 mm long, with 4 lobes, recurved when open and exposing anthers. *Stamens* with a slender filament, 1.5—2 mm long, anthers 1.5 mm long. *Style* 2 mm long. *Fruit* oblong to subglobose, 6×4 mm to 7×6 mm, ripening black; pedicel 2—3 mm long.

Distribution: Philippines: Luzon, Mindoro.

Habitat: Primary forest, lowland to 2000 m.

PHILIPPINES. Luzon. *Cuming 1213* and thirty other collections. — Mindoro. *Sulit and Conklin 17631* (K, L), *17683* (A, K, L).

Remarks: *Ligustrum cumingianum* is here restored to specific rank. Mansfeld reduced this species to a variety of *L. glomeratum* on the grounds that the only difference was in the fruit size and shape (globose and 4 by 3 mm as opposed to the oblong 8 by 5 mm fruit of *L. glomeratum*), This character is not always reliable as immature fruits of species with globose mature fruits are often oblong. *L. cumingianum* can readily be distinguished from *L. glomeratum* by its much smaller inflorescences and in this character more closely resembles *L. confusum* in Malaya.

Merrill (Philip. J. Sci. 7, 1912: 329) considered this taxon as 'only a more glabrous form' of *L. pubinerve* (i.e. *L. glomeratum*). Elmer emphasised the glabrous nature of his *L. glabrinerve* as the principle difference between it and *L. pubinerve*. Indumentum of *Ligustrum* species is extremely variable and is not reliable for separating the taxa of this genus. Elmer

also described his species as possessing five corolla lobes, atypical for the genus, and from dissection I have found his specimens to have only four.

3. Ligustrum glomeratum Blume

L. glomeratum Blume, Mus. Bot. 1 (1850) 314; Decaisne, Nouv. Arch. Mus. Paris II, 2 (1872) 32; Mansfeld, Bot. Jahrb. 59: Beibl. 132 (1924) 58; Backer & Bakh. *f.*, Fl. Java 2 (1965) 215; Steenis, Mountain Fl. Java (1972) pl. 30—8. — Lectotype: *Blume 945*.
Phillyrea robusta auct. non Roxb.: Bl., Bijdr. (1826) 681.
L. racemosum Noroña, Verh. Bat. Gen. 5 ed. 1: Art. 4 (1790) 19 (*ex* Index Kew).
L. obtusiusculum Bl., Mus. Bot. 1 (1850) 314; Decaisne, l.c. 31.
L. pubinerve Bl., l.c. 314; Decaisne, l.c. 30; Merrill, Philip. J. Sci. 7 (1912) 329; Enum. Philip. Fl. Plants (1923) 305.
L. undulatum Bl., Mus. Bot. 1 (1850) 314; Decaisne, l.c. 23; Mansfeld, l.c. 59; Lingelsheim, Bot. Jahrb. 61 (1927) 16. — Type: *Herb. Zippelius s.n.* (L).
Visiania robusta Miq., Fl. Ind. Bat. 2 (1857) 547.
Visiania pubinervis (Bl.) Miq., l.c. 548.
Visiania undulata (Bl.) Miq., l.c. 548.
Visiania glomerata (Bl.) Miq., l.c. 549.
Visiania sumatrana Miq., l.c. 549.
Visiania phyllothyrsa Miq., Fl. Ind. Bat. Suppl. 1 (1861) 558.

Shrub or small tree to 15 m tall. *Twigs* pale brown, densely hairy near apex, lenticellate. *Leaves* ovate-lanceolate to oblong elliptic, base rotund or cuneate to decurrent, apex acuminate to cuspidate (rarely obtuse), (3—)7—8(—9) cm by (2—)3.5(—5) cm, papery to subcoriaceous, glossy above, glabrous below or very hairy on lower midrib, midrib grooved above, veins conspicuous above and below, 6—7 pairs. Petiole 5—9 mm long, glabrous or pubescent. *Inflorescences* pyramidal, 8—17 cm long, with 5—9 tiers of branches, lowest branch 6—10 cm long, more or less horizontal, main axis pubescent to villous. Bracts 3 cm long. *Flowers* densely clustered, subsessile or with pedicel to 1 mm long, sweetly scented, 2—3(—4) mm long. *Calyx* scarcely lobed, tube 1 mm long, glabrous. *Corolla* white or yellow, tube 1 mm long. *Stamens* with filament 2 mm long, anthers projecting beyond the corolla tube in the open flower. *Style* 1—2 mm long, slender and projecting beyond the calyx tube after the corolla has fallen. *Fruit* ellipsoid to obovoid, 5—8 mm long and 4—5 mm broad, fleshy, ripening dark purple, tasting bitter sweet, with 1(—3) seeds; pedicel 2—5 mm.

Distribution: S. Thailand, N. Malaya, Sumatra, Borneo, Philippines, Java, the Lesser Sunda Is., Celebes, the Moluccas, and New Guinea.

Habitat: Primary and secondary forest, lowland to 2650 m on mossy ridges.

MALAYA. Perlis. *Kochummen 98759* (K, KEP), *Whitmore 10486* (K, KEP, L).
SUMATRA. *Forbes 2102* (BM, L), *2315* (BM), and about 25 others.
BORNEO. Sabah. *Gibbs 3031* (BM, K), *Lajangah 28544* (K, L, SAN), and about 10 others.
PHILIPPINES. Luzon. *Loher 12151* (A), *12442* (A), *13031* (A), *14383* (A), and about 10 others. — Mindoro. *Conklin 17534* (A), *Sulit and Conklin 17631* (A). — Palawan. *Edaño 14023* (A, K, L), *Sulit 12347* (A, L). — Mindanao. *Fénix 26060* (A, BM, K, L), *Ramos & Edaño 38932* (A, K). — Sulu. *Kondo & Edaño 38922* (A), *Ramos & Edaño 44305* (A, BM, K).
JAVA. *Blume 945* (L), *1030* (L), *Junghuhn s.n.* (L), *de Vriese s.n.* (L), and about 40 others.
LESSER SUNDA ISLANDS. Bali. *Dilmy* 1135 (L). — Sumba. *Iboet 392* (L). — Flores. *Schmutz 1090* (L), *2038* (L), *2880* (L), *Verheijen 2083* (L). — Timor. *Kooy 393* (L).
MOLUCCAS. *Toxopeus 87* (L), *437* (L), *Kostermans 860* (K, L), *Raut 773* (K), *de Vriese & Teijsman s.n.* (L).
CELEBES. *Boschproefstation cc. 0570* (L), *de Jong 46* (L), *Kaudern 517* (L), *Neth. Ind. For. Ser. bb 20425* (L), *Rachmat 900* (L).
NEW GUINEA. *Zippelius s.n.* (L). — Vogelkop. *van Royen 3813* (L), *van Royen & Sleumer 6705* (A, K, L). — Papua. *Womersley 14120* (A, K, L), *15386* (A, K, L), and about 20 others.

Remarks: *Ligustrum glomeratum* not only has a wide spread distribution throughout Malesia (Fig. 1), which it might owe to its ability to thrive in open places and secondary forests, but also shows a wide range of variation in leaf shape, size, and indumentum. Blume (1850) and Miquel (1857) tried to take account of this variation by describing several species (see synonymy above). Mansfeld (1924) did not designate a type specimen because he felt one specimen could not represent the variation within this species. Blume did not cite a type in his original description but as he considered *L. glomeratum* to be confined to Java, his description was probably based on his Javanese collections; thus *Blume 945* is designated the lectotype.

The description of *L. undulatum* was based on a New Guinea specimen from Zippelius' herbarium determined *Phillyrea undulatum*. Mansfeld considered that Zippelius' specimen was wrongly localised as, at that time, *Ligustrum* was not known from New Guinea, and that it differed from *L. glomeratum* (which has an oblong fruit) by its smaller (immature) round fruit. Examination of the type specimen shows it to be typical *L. glomeratum* in its infructescence and leaf characters and its location is no longer improbable as recent collections show that two species, *L. glomeratum* and *L. novoguineense*, are both indigenous to New Guinea.

L. glomeratum is cultivated as a hedge plant around Bogor, Java (Backer & Bakh. *f.*, 1965).

4. **Ligustrum novoguineense** Lingelsheim

L. novoguineense Lingelsheim, Bot. Jahrb. 61 (1927) 15—16. — Type: *Schlechter 18286* (iso in BM, K, L).

Shrub or small tree to 12 m tall. *Twigs* pale brown, glabrous and lenticellate. *Leaves* elliptic lanceolate, base rounded to cuneate, apex acuminate, 7—15 cm by 3—6.5 cm, membraneous to subcoriaceous, dark green above, much paler below, glabrous, midrib slightly indented above and depressed below, veins conspicuous above and below, 5—9 pairs. Petiole 0.5—1.5 cm long, grooved above. *Inflorescences* pyramidal, 9—12(—15) cm long, with 7—9 tiers, lowest branch 6—9 cm long, main axis glabrous to minutely pubescent. *Flowers* widely spaced, pedicel 1—3 mm long, fragrant. *Calyx* scarcely lobed, tube 1 mm long. *Corolla* 3—4 mm long, with recurved lobes when open, white. *Stamens* with filaments 1 mm long, anthers scarcely projecting beyond the corolla tube in the open flower, 1 mm long. *Style* 1.5 mm long and projecting beyond the calyx tube after the corolla has fallen. *Fruit* globose to ovoid, 7 by 5 mm, green ripening black; pedicel 3—5 mm.

Distribution: New Guinea.
Habitat: Primary forest, lowlands to Castanopsis-oak forests.

NEW GUINEA: East. *Schlechter 18286*, *Brass 1623* (A, K), *1663* (A, K), *32426* (A, K, L), *32518* (A, K, L), *Clemens 11095* (A), *Cruttwell 643* (K, L), *Floyd 5253* (A, BM, K), *Fryar 3964* (A, BM, K), *3965* (A, K), *Hartley 10895* (K, L), *Pullen 658* (L).

Remark: The two species of *Ligustrum* in New Guinea are the endemic *L. novoguineense* and the widespread *L. glomeratum*. Although similar in their inflorescence form they can be distinguished by a combination of the following characters — *L. novoguineense* has larger leaves, well-spaced pedicellate flowers with a longer corolla, and its habitat is in primary forest (*L. glomeratum* in New Guinea is more commonly collected from open country or secondary forest).

5. **Ligustrum sinense** Loureiro

L. sinense Loureiro, Fl. Cochinchin. (1790) 19; DC., Prodr. 7 (1844) 295; Gard. Chron. n.s. 10 (1878) 364—5, fig. 64; Mansfeld, Bot. Jahrb. 59: Beibl. 132 (1924) 60; Corner, Wayside Trees Malaya (1940) 152, text fig. 172.

Shrub to 4 m. *Twigs* grey, densely pubescent to subvillous or more or less glabrous. *Leaves* ovate-elliptic, base cuneate to subrotund, apex acuminate to subrotund, 3—7 cm by 2—4 cm, glabrous to pilose beneath, membraneous to subcoriaceous, lateral veins 5—6 pairs. Petiole 0.75—1 cm long, subvillous. *Inflorescences* pyramidal, 6—11 cm long, axis subvillous, with 3—4 tiers of branches, lowest branch 2.5—4 cm long. *Flowers* 2—3 mm long, very fragrant; pedicel 1—3 mm long. *Calyx* scarcely lobed, tube 1 mm long. *Corolla* 3 mm long, white. *Stamens* with slender filament 1.5 mm long, anther 1 mm long. *Style* 1 mm long. *Fruits* ovoid 6 by 5 mm, green ripening black; pedicel 3—4 mm long.

Distribution: Southern China and Hongkong, cultivated in Malaya.

MALAYA (cultivated). Taiping, 1899 (SING), *Corner s.n.* (SING), *Mohd. Haniff 1236* (BM, K, SING), *Purseglove P 4333* (K, L), *Ridley 1917* (K), *T & P 415* (K, KEP).

Remark: This species is sometimes cultivated in Malaya as a hedge plant where it is apparently evergreen and flowers and forms fruits. The first record of its cultivation is a collection dated 1899 from Taiping Hills.

6. **Ligustrum stenophyllum** Quisumbing & Merrill

L. stenophyllum Quisumbing & Merrill, Philip. J. Sci. 37 (1928) 188. — Type: *Ramos & Edaño 47153* (iso in A, K).

Shrub to 3 m tall. Young *twigs* pale brown, shortly pubescent and lenticellate. *Leaves* narrowly lanceolate, base and apex narrowly acute, 6—8.5 cm long and 1—1.5 cm wide, membraneous to subcoriaceous, glabrous, veins not conspicuous either above or below, lateral veins 5—7 pairs acutely ascending to margin. Petiole 0.5 cm long. *Inflorescences* 6—9 cm long with 6—7 tiers, lowest branch 2.5—4 cm long, axis densely pubescent. Bracts linear, 0.5—1 cm long. *Flowers* 2—3 mm long, not clustered; pedicel 1 mm long. *Calyx* tube 1—1.5 mm long, glabrous. *Corolla* 2—3 mm long, white, lobes more or less equal in length to tube, oblong to acute. *Stamens* with long slender filaments, anthers projecting beyond the corolla tube, oblong, 2 mm long. *Style* slender. *Fruit* not known.

Distribution: Philippines: Luzon.
Habitat: Forest streams at 400 m.

PHILIPPINES. Luzon. Isabela Prov. *Ramos & Edaño 47153*, *Clemens 16782* (K).

Remarks: This species is known from only two collections and is remarkable for its long narrow leaves which are quite unlike any other Malesian species. Collecting labels give the impression that it was collected from riverine communities but they are not sufficiently specific to judge if this species is a rheophyte or not.